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FAMILY PHYSICIANS

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Recommended Curriculum Guidelines for Family Medicine Residents

Cardiovascular Medicine

This document was endorsed by the American Academy of Family Physicians (AAFP).

Introduction

This Curriculum Guideline defines a recommended training strategy for family medicine residents. Attitudes, behaviors, knowledge, and skills that are critical to family medicine should be attained through longitudinal experience that promotes educational competencies defined by the Accreditation Council for Graduate Medical Education (ACGME), www.acgme.org. The family medicine curriculum must include structured experience in several specified areas. Much of the resident's knowledge will be gained by caring for ambulatory patients who visit the family medicine center, although additional experience gained in various other settings (e.g., an inpatient setting, a patient's home, a long-term care facility, the emergency department, the community) is critical for well-rounded residency training. The residents should be able to develop a skillset and apply their skills appropriately to all patient care settings.

Structured didactic lectures, conferences, journal clubs, and workshops must be included in the curriculum to supplement experiential learning, with an emphasis on outcomes-oriented, evidence-based studies that delineate common diseases affecting patients of all ages. Patient-centered care, and targeted techniques of health promotion and disease prevention are hallmarks of family medicine and should be integrated in all settings. Appropriate referral patterns, transitions of care, and the provision of cost-effective care should also be part of the curriculum.

Program requirements specific to family medicine residencies may be found on the ACGME website. Current AAFP Curriculum Guidelines may be found online at www.aafp.org/cg. These guidelines are periodically updated and endorsed by the AAFP and, in many instances, other specialty societies, as indicated on each guideline.

Each residency program is responsible for its own curriculum. **This guideline provides a useful strategy to help residency programs form their curricula for educating family physicians.**

Preamble

Cardiovascular disease is a major cause of morbidity and mortality in our society. The family physician should be proficient in the diagnosis and management of a variety of cardiovascular disorders. Family physicians provide comprehensive and continuing care to individuals and families, with particular attention to behavioral and lifestyle factors, and social determinants of health.

The depth of experience required for each resident depends on his or her expected practice needs, especially in terms of practice location, available facilities, and accessibility of consultants. At times, the family physician may find it appropriate to seek consultation from a cardiologist to either manage or co-manage a patient for optimal care. In other situations, the family physician may need to provide the totality of care to the patient, including cardiovascular care.

Competencies

At the completion of residency training, a family medicine resident should:

- Understand basic and clinical knowledge of cardiac anatomy, and pathophysiology of common cardiovascular diseases (Medical Knowledge)
- Perform an appropriate cardiac history and physical examination, document findings, develop an appropriate differential diagnosis, and plan for further evaluation and management (Patient Care, Medical Knowledge, Interpersonal and Communication Skills)
- Use evidence-based knowledge regarding primary and secondary prevention of cardiovascular disease (Medical Knowledge, Patient Care)
- Understand the influence of race, gender, and cultural differences on cardiovascular health (Patient Care, Medical Knowledge, Interpersonal and Communication Skills, Practice-based Learning and Improvement)
- Review current practices regarding the care of patients who have cardiovascular disease and develop plans to improve care (Patient Care, Medical Knowledge, Practice-based Learning and Improvement, Professionalism)
- Work with physicians, nurses, pharmacists, nutritionists, and other health care professionals who care for patients who have common cardiovascular diseases (Patient Care, Medical Knowledge, Professionalism, Systems-based Practice)
- Perform cardiac resuscitation and procedures necessary to stabilize a patient experiencing a cardiac emergency (Medical Knowledge, Patient Care)

Attitudes

The resident should demonstrate attitudes that encompass:

- Awareness of the importance of the physician and patient working as partners to promote optimal cardiovascular health
- A compassionate approach to the care of patients who have cardiac disease
- Understanding of the psychosocial and economic impact of cardiovascular disease on the individual and family, and use of the health care system to assist as needed
- Support of the individual and family through consultation, evaluation, treatment, and rehabilitation
- Recognition of the importance of lifestyle factors and social determinants of health on the development and exacerbation of cardiovascular disease
- Appreciation of a multidisciplinary approach to the care of individuals who have cardiovascular disease

Knowledge

In the appropriate setting, the resident should demonstrate the ability to apply knowledge of:

1. Normal cardiovascular anatomy and physiology
2. Changes in cardiovascular physiology with age and pregnancy
3. Risk factors
 - a. Coronary artery disease
 - i. Hyperlipidemia
 - ii. Cigarette smoking
 - iii. Genetic predisposition
 - iv. Sedentary lifestyle
 - v. Hypertension
 - vi. Diabetes mellitus
 - vii. Obesity
 - viii. Nutrition
 - ix. Hormonal status
 - x. Emotional stress
 - b. Valvular heart disease
4. Cardiovascular history

5. Cardiovascular physical examination
6. Noninvasive diagnostic studies
 - a. Electrocardiography (ECG)
 - b. Chest radiography
 - c. Stress testing, including exercise or pharmacologic techniques
 - d. Echocardiography/Doppler imaging, both rest and stress, using exercise or pharmacologic techniques
 - e. Radioisotope imaging, both rest and stress, using exercise or pharmacologic techniques
 - f. ECG monitoring (in-hospital and ambulatory)
 - g. Vascular Doppler and ultrasound examinations
 - h. Computed tomography (CT)
 - i. Magnetic resonance imaging (MRI) and magnetic resonance angiography (MRA)
7. Invasive diagnostic studies and interventions
 - a. Cardiac catheterization and angiography
 - b. Carotid and peripheral vascular angiography
 - c. Intracoronary and peripheral vascular intervention using appropriate devices
 - d. Internal monitoring devices
 - i. Central venous and peripheral arterial catheter
 - e. Electrophysiologic studies
 - f. Indications and contraindications for therapeutic interventions
 - i. Coronary artery bypass
 - ii. Angioplasty techniques and stent placement
 - iii. Pacemaker insertion
 - iv. Implantable cardioverter-defibrillator
 - v. Valve replacement/repair, percutaneous balloon valvotomy
 - vi. Electrophysiologic ablation
8. Relevant laboratory interpretation, including serum enzymes, isoenzymes, lipids, and b-type natriuretic peptide (BNP) or pro-BNP
9. Specific diseases/conditions
 - a. Coronary artery disease
 - i. Stable angina
 - ii. Acute coronary syndrome
 - 1) Unstable angina

- 2) ST elevation myocardial infarction (STEMI) and non-ST elevation myocardial infarction (NSTEMI), with and without complications
 - a) Cardiogenic shock
 - b) Dysrhythmias
 - c) Papillary muscle dysfunction and rupture
 - d) Ventricular rupture
 - e) Aneurysm
 - iii. Sudden death
 - b. Syncope, cardiogenic and noncardiogenic
 - c. Dysrhythmias
 - i. Tachyarrhythmia
 - 1) Supraventricular
 - 2) Ventricular
 - 3) Reentrant
 - ii. Bradyarrhythmia
 - iii. Ectopy
 - 1) Atrial
 - 2) Ventricular
 - d. Hypertension
 - i. Essential
 - ii. Secondary
 - iii. Pulmonary
 - e. Pulmonary heart disease
 - i. Cor pulmonale
 - f. Heart failure
 - i. Systolic dysfunction
 - ii. Diastolic dysfunction
 - g. Venous thromboembolic disease (VTE)
 - h. Valvular heart disease
 - i. Rheumatic
 - ii. Congenital
 - iii. Degenerative
 - iv. Mitral valve prolapse syndrome
 - i. Congenital heart disease
 - i. Common left to right shunts (acyanotic)
 - ii. Common right to left shunts (cyanotic)
 - iii. Common obstructive problems
 - j. Dissecting aneurysm
 - k. Innocent heart murmurs
 - l. Peripheral vascular disease
 - i. Aneurysm
 - ii. Carotid atherosclerosis

- iii. Arterial disease
 - iv. Arteriosclerosis obliterans
- m. Cardiomyopathies
 - i. Congestive (dilated)
 - ii. Restrictive
 - iii. Hypertrophic cardiomyopathy
 - iv. Postpartum
- n. Pericardial disease
- o. Infection-related
 - i. Viral myocarditis
 - ii. Subacute bacterial endocarditis
 - iii. Kawasaki disease
- p. Other cardiac disorders
 - i. Immunologic
 - 1) Acute rheumatic fever
 - 2) Autoimmune disorders
 - ii. Psychogenic
 - iii. Traumatic
 - iv. Nutritional
 - v. Myxoma
 - vi. Thyroid dysfunction
 - vii. Marfan syndrome
 - viii. Drug-related, such as cocaine, corticosteroids, or chemotherapeutic agents
- q. Evaluation of cardiac patient for noncardiac surgery
 - i. Cardiac risk, including preoperative assessment tools
 - ii. Preoperative and postoperative management
- r. Antibiotic prophylaxis for valvular disease

10. Cardiovascular pharmacology

Skills

In the appropriate setting, the resident should demonstrate the ability to perform or appropriately refer the following skills:

1. Diagnostic procedures
 - a. Obtaining history and performing physical examination
 - b. Mechanics and interpretation of ECG
 - c. Interpretation of chest radiographs
 - d. Exercise stress test monitoring and interpretation
 - e. Ambulatory ECG monitoring and interpretation

2. Therapeutic procedures
 - a. Risk management
 - b. Cardiopulmonary resuscitation (CPR), both basic life support (BLS) and advanced cardiac life support (ACLS)
 - c. Treatment of dysrhythmias and conduction disturbances
 - d. Use of external temporary pacemakers
 - e. Management of acute myocardial infarction, postinfarction care, and complications
 - f. Congestive heart failure
 - g. Hypertensive urgencies and emergencies
 - h. Supervision and management of cardiovascular rehabilitation
 - i. Addressing the impact of social determinants of health on cardiovascular health
 - j. Incorporation of biopsychosocial issues in overall management
 - i. Sexual function
 - ii. Depression
 - iii. Family dynamics
 - k. Management of patients after an intervention
 - i. Lifestyle adjustments
 - ii. Coronary artery bypass surgery
 - iii. Valve surgery
 - iv. Congenital heart disease surgery
 - v. Catheter-related interventional procedures

Implementation

Core cognitive ability and skill may be obtained through longitudinal or block rotations, or cardiology experiences in intensive care and cardiac care units. Residents will obtain substantial additional cardiology experience throughout the three years of experience in the family medicine practice, on their family medicine inpatient service, and through internal medicine experiences. During this time, it would be a reasonable goal to accomplish proficiency in ECG interpretation and CPR.

Family medicine residents electing additional training in cardiology—particularly residents who are planning to practice in communities without readily available consultation resources—may require skills for which additional training in a structured cardiology education program is strongly recommended. Longitudinal experience in the center for family medicine, on the family medicine inpatient service, and in the emergency department should add experiences in ECG interpretation, stress testing, coronary care, and continued follow-up for patients who have cardiovascular problems.

Additionally, residents should be encouraged to evaluate the fashion in which they provide cardiology care for their patients. Using a Plan-Do-Study-Act (PDSA) cycle or

other quality improvement process, learners should engage in practice-based learning and improvement to ensure that patients receive optimal care founded in evidence-based medicine.

Resources

Mann DL, Zipes DP, Libby P, Bonow RO. *Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine*. 10th ed. Philadelphia, Pa: Saunders; 2014.

Wagner GS, Strauss DG. *Marriott's Practical Electrocardiography*. 12th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2014.

Website Resources

Many resources are available on the Internet, including tools for ECG interpretation and cardiac auscultation. We do not endorse any particular website for these purposes but suggest a search for the most current products. Additionally, the following sites are refereed and useful in a cardiology curriculum:

American Academy of Family Physicians, *American Family Physician (AFP)* by Topic. Coronary Artery Disease/Coronary Heart Disease.

www.aafp.org/afp/topicModules/viewTopicModule.htm?topicModuleId=4

American Academy of Family Physicians. Board review questions, including cardiology groupings. www.aafp.org/online/en/home/cme/boardrev/questions.html

American College of Cardiology. www.acc.org

American College of Chest Physicians. Guidelines and Resources.

www.chestnet.org/Guidelines-and-Resources

Centers for Disease Control and Prevention. Heart Disease.

www.cdc.gov/HeartDisease/

National Institutes of Health, National Heart, Lung, and Blood Institute. Heart and Vascular Resources. www.nhlbi.nih.gov/health-pro/resources/heart

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